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AUTHOR Clark, Larry
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ABSTRACT

A rationale, background information, and a discussion of methodology are presented for a needs assessment process intended for pilot implementation at Western Piedmont Community College (WPCC). This process was designed to assess the local need for paraprofessional programs in the Human Services area, i.e., Early Childhood Associate, Mental Health Associate, Paralegal Aide, Social Services Counselor, Teacher Associate, and Mental Retardation Associate. The report first presents the assumptions, limitations, and definitions to be used in the assessment and then reviews relevant literature pointing to the lack of research into local needs assessment procedures. The proposal hypothesizes that a needs assessment process can be operationally defined and require only limited resources, that the data provided will be sufficient to permit intelligent decision-making about Human Services programs, and that the same data will be useful for academic advisement. Next, the four surveys to be conducted in the WPCC service area are described. They are: (1) a job market survey of 100 businesses and agencies; (2) a stratified survey of paraprofessional and auxiliary staff currently employed; (3) a survey of 300 WPCC students; and (4) a survey of 120 high school students. The report concludes with a discussion of procedures and data analysis techniques, and includes the survey instruments. (JP)

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A SIMPLIFIED PROGRAM NEEDS ASSESSMENT PROCESS

by
Larry Clark

Western Piedmont Community College
Department of Social and Behavioral Sciences
Morganton, N. C. 28655

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A SIMPLIFIED PROGRAM NEEDS ASSESSMENT PROCESS

Introduction

The fifty-eight member Community College System of North Carolina is charged by the state legislature to offer a wide variety of educational opportunities to the citizens of their respective areas.[1] All institutions within the system have a Continuing Education Division that schedules avocational classes, adult high school completion studies, and on-the-job training programs for local industries and agencies. While only twenty institutions offer the two-year college transfer degree program, all institutions must develop both two-year occupational degrees and one-year diploma programs.

The two-year occupational degree programs prepare students for para-professional positions in private industry, private business, and public service agencies. Currently, there are more than 130 such programs across the state which include business administration, industrial maintenance, criminal justice, nursing, and educational aide.[2] Only those occupational programs related to the Human Services area, i. e., Early Childhood Associate, Mental Health Associate, Paralegal Aide, Social Services Counselor, Teacher Associate, and Mental Retardation Associate are the principle concern of this proposal.

The task of identifying, planning, and implementing new occupational curricula is a never-ending one for the community-based college. Students enroll in a program of training and study that is expected to prepare them for a specific job in one or two years. However, the complexities of surveying regional job markets and of projecting future employment

needs are most often overwhelming for the staff of a small community college. In most cases, new programs are implemented without adequate needs assessment and study. Educational researchers have only recently become interested in developing needs assessment models that can serve as an ". . . all important precursor to decisions about whether to implement a program and about the size and scope of the installation."[3] To date researchers have produced suggestions which tend to offer little help to the small community college with limited resources.

Statement of the Problem

The purpose of this study is to investigate the following question: What simplified needs assessment model will determine the Human Services career priorities of adults in a community college service area?

Significance of the Problem

A 1976 report by the American Association of Community and Junior Colleges indicated that "Higher education and the human service delivery system of this country are witnessing a social movement of major proportions--the widespread use of middle level workers in such areas as mental health, public school education, social work, gerontology, and corrections. And the two-year colleges are right in the middle. . . ."[4] While reservations were raised by professionals in the beginning, the demand for paraprofessionals has continued to grow; and the community college has become the primary training facility. In the 14 states of the South alone, over 200 active human services programs are currently being offered in more than one hundred two-year colleges.[5] During the past decade the Southern Regional Education Board has been a leader in conducting regional studies

to assess the core of competencies necessary for effective human services programs.[6] The National Institute for Mental Health has been an important source of funding for program research and development.

The North Carolina Community College System appears to have kept pace with the national and regional trend during this period. Currently, one or more of 18 different human services programs are offered in most of the member institutions. In fact, the recent creation of a separate governing board for the state's community colleges may actually accelerate the development of paraprofessional occupation programs. Speaking at a meeting of community college presidents, Governor Hunt announced a plan ". . . to renew and revitalize the long-standing commitment of the Department of Community Colleges to serve its appropriate role in the economic development of the State of North Carolina. . . ."[7] Commerce Secretary Faircloth and newly appointed president of the Community College System, Dr. Blake, reiterated this theme by describing "a mission" that will include both the training and education necessary to serve new and expanding industries and agencies across the state.

In attempting to meet this educational need, the community colleges in North Carolina will be required to allocate their limited resources most carefully. Since most of the students attending these institutions come from within a 15-mile radius of the campus, assessing <u>local</u> job markets and program needs will demand a method for identifying which programs best satisfy the local situation. The results of this proposal will have application in the following areas:

(1) provide a simplified program assessment model that can be implemented at the local level;

(2) provide a rationale for conducting a needs assessment of Human Services programs;

(3) provide the guidelines necessary for conducting needs assessments in other occupational program areas, i. e., industrial management, secretarial, automotive, etc.; and

(4) provide important job projection data and career information during the academic advisement of students.

Assumptions

For the purposes of this study, it is assumed that the data provided in the 1976 Profile of Students in North Carolina Community Colleges and Technical Institutes remain essentially the same.[8] Those items relating specifically to occupational programs and program assessment include:

--"Among (curriculum) students, females, non-white adults, persons who are not high school graduates, and persons 30 years of age and older are under-represented in enrollments when compared with the (N. C.) adult population."[9] This group represents an untapped source of enrollment.

--The enrollment trends are toward technical programs, evening classes, part-time female students in the 26-49 age group who are currently employed. These students would not have attended another institution of higher education.

--It is also significant to note how these students found out about the programs they selected to attend. In order of importance, they are friends, college literature, and news media--not family or high school counselors as one might suspect.

Since Western Piedmont Community College, Morganton, will serve as a pilot project, it is assumed that this institution represents the typical institution in the Community College System.[10] It is further assumed that the data represented in the 1975 Overview: Burke County, based upon a survey of 79 county leaders, are still accurate.[11] A basic conclusion of this study was that the two top priorities for the future were (1) the development of new job opportunities and (2) the support of local educational programs.

Furthermore, a survey of Burke County high school seniors (N=618) supported by an Appalachian State University grant in 1974 revealed student preferences from a list of 96 careers which included several human services occupations.[12] Approximately 130 students, or 18%, checked the areas of teaching, childcare, social work, pre-law, and police work. A related business-industry survey conducted at the same time provides very little data on the human services areas.

Delimitations

The scope of this study will be limited to one institution, Western Piedmont Community College, and to one curriculum program area, human services. Since 73% of the student enrollment resides in Burke County, only the businesses, industries, and agencies within the county will be included.[13] Since the needs assessment models which exist are more applicable to state and regional surveys, this proposal attempts to adapt certain elements from several models to be used on the local level. Furthermore, the major thrust of this proposal is to emphasize needs assessment from the standpoint of program areas and not institution-wide program needs.

Limitations

Without outside funding, the implementation of this proposal will be severely limited. Sufficient time is needed to develop the appropriate questionnaires and to adequately field test the instruments before attempting the survey. Other limitations may be in the attitudes of the participants to be involved and in the percentage of returns. Job market data will depend upon the accuracy of company files and some speculation on the part of participants. Not all of the participants will be residents of Burke County since a certain number will be working and/or studying here but living elsewhere.

Definition of Terms

1. Needs Assessment--the process by which one identifies needs and decides upon priorities among them. Occassionally referred to as context evaluation or front-end analysis.
2. Human Services--careers and educational programs that include those skills necessary for helping people. For the purpose of this proposal, "human services" includes paraprofessional level counselors, mental and retardation workers, teachers, and para-legal aides.
3. Paraprofessional--a person possessing the education and the skills necessary for working under the direction of a professional level staff person. In terms of formal education, the paraprofessional has typically received one or two years of higher education.

4. Systems Approach--a research method that attempts to develop a precise and detailed flowchart of all inputs, variables, alternatives, and procedures for decision-making.
5. Program--a structured course of study that permits a student to earn a diploma or degree which signifies the attainment of specific knowledge and skills. In this proposal, a "program" may be one specified curriculum or a combination of related curricula, i. e., human services.
6. Job Market Survey--the collection of employment data from specified businesses and agencies that reflect the number of persons working in specific job positions. Projection of future job needs may be extrapolated.

Review of Related Literature

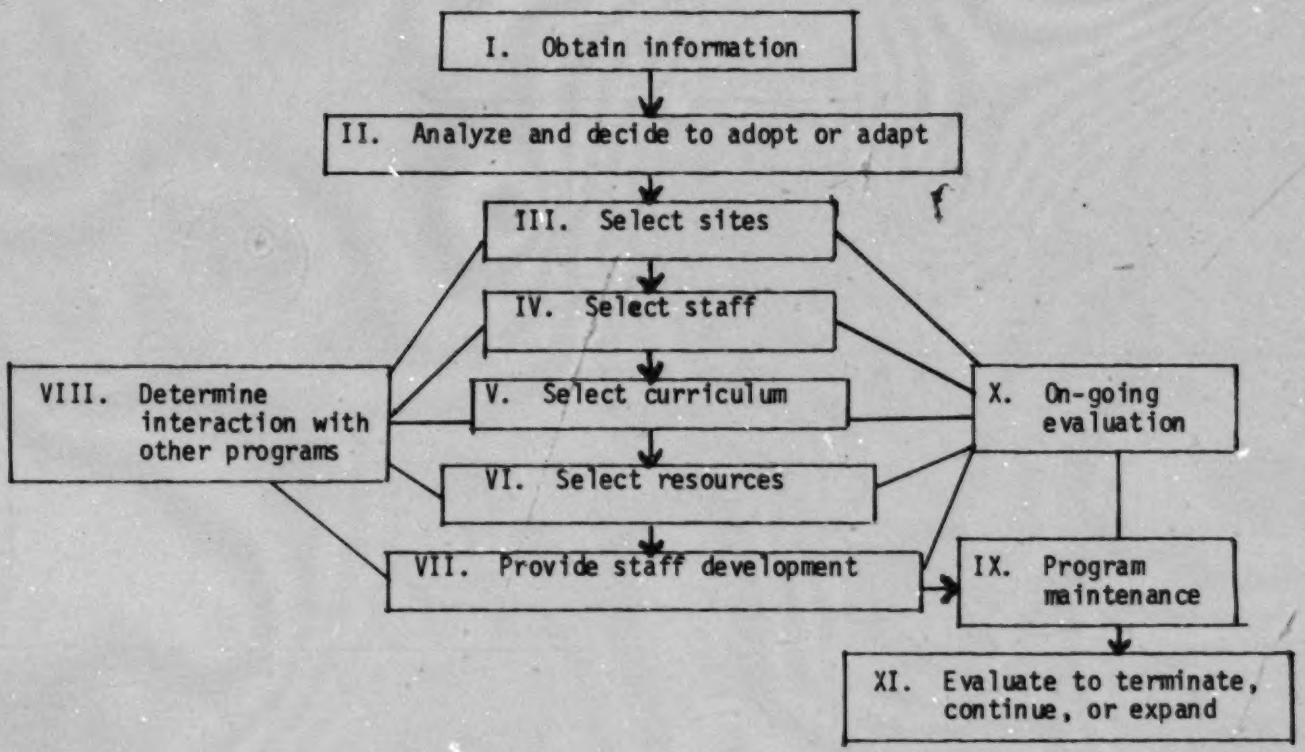
During the past decade, the topics of evaluation research, curriculum evaluation, and program development have appeared in increasing number in educational literature. Sparked by public demands for accountability, increased federal funds for research, and the complexities of modern educational organizations, the educational researcher has attempted to produce the criteria, methods, and models necessary for intelligent decision-making. However, current authors in the field of program evaluation indicate that these goals have not been achieved and, significantly, that even the terminology has not become standardized.[14] The literature appears to be in a state of flux and provides little help to the novice or befuddled administrator seeking quick and inexpensive answers to local curriculum problems.

Needs assessment is a related subfield of program evaluation that is an even more recent phenomenon. Variously called context evaluation and front-end analysis, needs assessment research is still in its infancy and appears to suffer from a lack of adequate designs.[15] Much of the current research follows a "systems approach" that is derived from business and industry product-production models.[16] Under the rubrics of PERT (Program Evaluation and Review Technique) and PPBS (Planning, Programming, Budgeting System), some educational researchers are attempting to develop a precise and detailed flowchart that will depict all inputs, decision-making points, variables, alternatives, and procedures for reaching the desired goals.

Paul Montello offers a modified PPBS approach for higher education program planning that places emphasis upon the planning and production phases.[17] The planning phase consists of five "cells" which include (1) evaluating the cultural context, (2) stating goals, (3) identifying needs, (4) planning the program, and (5) structuring the program. After careful consideration of these preliminary steps, the production phase identifies the (1) outcome objectives, (2) content, (3) instructional methods, (4) program effectiveness, and (5) administrative commitment. This is similar to the four-step CIPP (Context, Input, Progress, Product) system proposed by Stufflebean and Guba.[18]

While impressive in some ways, the systems approach tends to provide an open-ended evaluation plan that requires a tremendous amount of pre-planning time and accumulates a mountain of data and opinions. This is not a program planning strategy that can be used by the typical small college administrator. The following flowchart by D. F. Thoms vividly illustrates this point.[19]

MAJOR STEPS IN PROGRAM DEVELOPMENT


I. Obtain information
II. Analyze and decide to adopt or adapt
III. Select sites
IV. Select staff
V. Select curriculum
VI. Select resources
VII. Provide staff development
VIII. Determine interaction with other programs
IX. Program maintenance
X. On-going evaluation
XI. Evaluate to terminate, continue, or expand

Adapated from D. F. Thoms, "From Needs Assessment to Implementation," Educational Technology, July 1978, Vol. 18, 5.

In an attempt to make some sense out of the jargon and various approaches to program planning, Roger Kaufman has recently proposed a taxonomy for needs assessment strategies.[20] Based upon the idea that planning and doing are the two key components of any systematic approach, Kaufman suggests that the critical question to ask is, "At what point are we entering the planning-evaluation cycle and which of the available strategies should be used?" In his scheme, a "need" may exist at one of six different entry levels depending upon the data available and/or restrictions placed on the process by the local situation. The six levels correspond to D. F. Thoms' flow-chart and include (1) identifying the problem, (2) determining solutions and alternatives, (3) selecting a solution, (4) implementation, (5) evaluating effectiveness, and (6) revisions. Using Greek letters to designate each level, Kaufman identifies the strategy or evaluative tool most appropriate for that level.

Level I: (Alpha) Needs assessment and problem identification by any means available.

Level II: (Beta) Determine available solutions by system analysis, front-end analysis, performance analysis, or stating behavioral objectives.

Level III: (Gamma) Determine plan by utilizing PPBS, simulation, gaming, operations research or systems analysis.

Level IV: (Delta) Implement plan with PERT, CPM, or management-by-objectives.

Level V: (Epsilon) Evaluate performance by testing and auditing.

Level VI: (Zeta) Revise program based upon discrepancy analysis.

Witkins offers some helpful hints by discussing some of the advantages and disadvantages of proposed planning systems and strategies.[21] For example, the identification of goals may include checklists, questionnaires, card sorts, and perceptual judgments. The advantage of such tools is increased involvement by participants; however, the disadvantages may invalidate the process—group input may not focus on the true needs and the analysis of opinions may be highly complex and judgmental. Another example is that discrepancy analysis may compensate for some of the above disadvantages, but new ones are created by using standardized procedures which may produce equal amounts of relevant and irrelevant data. Witkins concludes that there is no "right way" to conduct needs assessment. "In many cases, this probably means choosing features of several models to fit the local situation—and inventing others."[22]

Joseph A. Sarthory explains the current status of needs assessment as a "mind set" that can be internalized and operationally carried out.[23] Modern education should be held accountable by state and federal governments for developing an assessment process, but these agencies should not mandate programs or management systems that are perceived as "solutions" to a problem. Sarthory takes the position that only the local administrator can attempt to answer the questions "Where are we?," "Where do we want to go?," and "How do we get from here to there?"

These opinions clearly show that the survey is a major tool of needs assessment and may take the form of a questionnaire, interview, observation, or a systematic analysis of records. As emphasized by Anderson and Ball, "The choice of a particular survey methodology depends in turn on (the)

purpose and also on the nature of the units to be surveyed and the level of confidence the evaluator seeks in the results."[24] A critical element related to the survey is that of sampling techniques that will produce a truly representative group. L. R. Gay cautions that the two major sources of sampling bias occur when the researcher selects volunteer participants or uses only those who are readily available.[25] For conclusions to be generalized to the total population, Gay indicates that random sampling, stratified sampling, cluster sampling, or systematic sampling must be used. A minimum of 10% in the test population should be surveyed with at least a 70% response from the sample.

Morgan and Feldman participated in the development of the San Diego Community College District educational needs assessment model.[26] Funded by the Mott Foundation, this on-going systems approach attempts to provide up-to-date information for program planning. The model appears simple enough—on the surface. The major elements are (1) identification of all groups possessing relevant data, (2) careful construction of questionnaires for each group (community, community leaders, college staff, current students, and former students), (3) careful selection of the sample from each group, and (4) data collection from face-to-face interviews of community residents and from questionnaires mailed to the other groups. What is not said about the model, but yet implied, is that the procedure is time consuming, expensive, and requires sophisticated hardware. For example, survey interviewers were trained in a ten-weeks workshop, and outside consultants were used to develop the questionnaires and to determine stratified samples.

Murphy and Martin describe how Piedmont Technical College in South Carolina followed a needs assessment process to develop a competency-based general education program.[27] Funded by a Title I grant, college staff utilized state employment data in an attempt to develop a Job Bank that would show the type of jobs available in a seven-county service area. A General Survey Form was devised to determine what training the people in the area wanted and what programs would attract these students to campus. Murphy and Martin indicate that the process fell apart when limited resources prevented full implementation of the plan. The Job Bank data were never put into a useable form and the General Survey of a stratified random sample of the population could not be conducted. New funding by the Fund for Improvement of Post-Secondary Education was received in 1977 that would permit a General Survey.

In the late 1960's, the North Carolina Department of Community Colleges produced the Manpower Information Manual: A Manual for Local Planning.[28] This massive document describes an "information gathering system" composed of three major elements: (1) a survey of business and industry, (2) a survey of graduates and "early leavers with marketable skills" (ELMS), and (3) a survey of high school seniors. Evidently designed as a program planning tool for the community colleges across the state, the system was tested in 1970-71 at Forsyth Technical Institute in Winston-Salem through a cooperative effort with DCC and the Research Triangle Institute.[29] Businesses and industries in a three-county area with over 50 employees

were interveiwed and a 12 1/2% random sample was taken from the remainder. Several statistical procedures were followed to project future job needs for the area. (See Appendix E.) Data on FTI graduates and ELMS were subtracted from projected job figures to more accurately determine future needs. A survey of high school seniors' educational and career goals provided data on 430 job titles. Based upon the data, conclusions were drawn as to the need for specific programs at FTI for the period 1972-1977.

Using essentially the same model, Appalachian State University received Title III funds to establish the Appalachian Consortium Special Development Project.[30] Between 1972-74 the Consortium involved ten community colleges in northwestern North Carolina, including Western Piedmont Community College , in an attempt to provide these institutions with program planning data. Reams of data were produced on the topics surveyed, and it is not known at this writing if any institution made practical use of the information. The information on Western Piedmont's service area provided very little data on Human Services since the procedure tended to overlook those agencies, businesses, and people.

Overall, the literature does not currently provide any easy solution to the problems of program planning. The "alphabet solutions" such as PERT, PPBS, MBO, and CIPP are impressive designs. However, in their complete form, none provide a manageable system for the small college and few speak specifically to the question of "what programs should be offered?" Where local needs assessments have been attempted with "simplified" designs, the product has been directed toward institutional

needs that, perhaps, provided as much irrelevant as relevant data. The one example in which a program needs assessment was attempted failed, perhaps, because the design was not appropriate for the resources available. The common theme throughout is that the first step in program planning is "needs assessment," and its purpose is to define the educational environment, to identify unmet needs, to delineate the problems associated with meeting those needs, and to formulate the goals to be achieved.[31] Only time will tell if educational researchers will develop an inexpensive and effective process for achieving these ends.

Hypotheses

This proposal has a three-fold goal with respect to career and program planning at the local two-year college level. Western Piedmont Community College and the people of Burke County, by participating in this pilot project, will be able to show the following:

(1) a program needs assessment process can be operationally defined that will require only limited resources and time,

(2) the data provided will be sufficient to permit intelligent decision-making about the Human Services program(s) under study, and

(3) the same data will provide important career information for the academic advisement of students.

Sample

The service population of Western Piedmont Community College includes the residents of Burke and several surrounding counties; however, as of this fall term, 73% of 1,557 curriculum students are from Burke County.[32] For the purposes of this study, only Burke County residents will participate.

With a labor force of approximately 30,000, Burke County is somewhat unique in that over one-third of these workers are employed in service agencies and non-manufacturing occupations.[33] A regional state mental hospital, corrections facility, school for the deaf, and center for retarded children employ many area citizens. Since this study is limited to questions concerning the Human Services programs, the survey population consists of approximately 5,000 professional and paraprofessional persons directly and indirectly associated with the human services field. Specifically, the following surveys will be conducted:

(1) A job market census survey of approximately 100 agencies and businesses that potentially or currently employ paraprofessional human services personnel. This will include five categories:
   (a) private law offices and municipal offices,
   (b) police, corrections, and sheriff departments,
   (c) mental health and retardation centers,
   (d) kindergarten, daycare, and public schools,
   (e) social services and counseling agencies.

(2) A stratified survey of paraprofessional level and auxiliary staff currently employed (N=3000) in the above five categories (N_S=400).

(3) A census of approximately 300 WPCC students currently enrolled in the Criminal Justice and Mental Health Programs.

(4) A census of approximately 120 high school students enrolled in the Health Occupations Program.

MEASURES

Appendix A, Human Services Occupations Survey, will be developed so as to gather job market data from the selected agencies and businesses. Appendix B, Survey of On-the-Job Adult Educational Needs, will be designed to determine the educational aspirations and needs of currently employed human services workers. Appendix C, Survey of Curriculum Students, will be used to determine WPCC student preferences on proposed programs. Appendix D, Survey of High School Student Career Goals, will provide data from those students interested in human services careers. Appropriate cover letters and instructions will be drafted to clarify the purposes of the survey.

Design of the Study

This proposal is based upon a descriptive research design. Data will be collected to test the stated hypotheses and to determine the current status of the human services job market in Burke County.

Careful consideration will be given to the samples and to the construction of the survey instruments. Each instrument will be field tested beforehand. To facilitate the process and to achieve one of the goals, all surveys will be conducted by mail or administered to groups. Participants not responding will be notified once by mail and then contacted by telephone. A census will be attempted on four of the five identified groups. Only the On-the Job survey will involve a random sample. Contact information on the five groups will be obtained from telephone listings, agency records, and agency personnel directors.

Treatment of the Data

A card file will be maintained for the mail survey listing each agency or person by name and by code number with a record of mailing dates, telephone contacts, replies, etc. Worksheets will be used to tabulate the responses to survey items by agency or person code number. No card file will be needed with the other survey forms.

Job market data for the survey year (1980), three years past, and an estimated three-year projection by the agencies will be used to forecast future job demands. Appendix E, Formula for Ten-Year Forecast of Employment, will be used as a simple linear extrapolation.

Through an analysis of the data, final conclusions may be drawn as to program needs in the area. College staff can then discuss the possible alternatives for satisfying these needs and consider the resources required for the implementation of all or part of the recommendations.

FOOTNOTES

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APPENDIX A

(EXAMPLE)

Human Services Occupations Survey

Directions: Answer the questions below to the best of your knowledge. Written responses of explanation will be appreciated.

A. Agency name: _____

B. Address: _____

C. Telphone: _____

D. Contact person: _____

E. Total number of employees: _____

F. Total number of jobs requiring educational degrees, diplomas, or certificates: _____

G. With all other factors equal among two job applicants, would you tend to hire (at a higher salary) the one applicant who has had formal training for the job? Yes ____ No ____ Makes no difference ____

H. As explained in the cover letter, provide the appropriate figures below for those job titles:

	1977	1980	1985	Estimated Turn-Over High	Medium	Low
(1)						
(2)						
(3)						
(4)						

I. Other areas in which we could assist you:

APPENDIX B

(EXAMPLE)

SURVEY OF ON-THE-JOB ADULT EDUCATIONAL NEEDS

1. Name: _____
   Last First Middle

2. Address: _____

   Phone: _____

3. Age: ____ 4. Sex: Male ____ Female _____

5. Current Employer: _____

6. Job Title: _____

7. Educational Level:
   ___ 1-4 years
   ___ 5-8 years
   ___ 9-12 years
   ___ High school graduate
   ___ Technical School
   ___ College 1-3 Years
   ___ College Graduate
   ___ Graduate Degree

8. Do you consider yourself handicapped? Yes ____ No ____
   If yes, how? _____

9. Are you currently enrolled or have you in the past taken a course at Western Piedmont Community College? Yes ___ No ____

10. Are you interested in using any of the following kinds of services (other than classes) that may be available to you at this institution?

    ____ 1. Use the campus as a place of study.

    ____ 2. Use the library

    ____ 3. Discuss educational and/or career plans with a staff member

    ____ 4. Personal counseling

    ____ 5. Testing to determine advanced standing in a program of study

    ____ 6. Testing for strengths and weaknesses in a subject

    ____ 7. Other _____

11. When is the most convenient time for you to take this course?

    ___ One evening a week
    ___ Two or more evenings a week
    ___ One afternoon a week
    ___ Two or more afternoons a week
    ___ One morning a week
    ___ Two or more mornings a week
    ___ One full day a week
    ___ Two or more full days a week
    ___ Weekends
    ___ During the summer only

12. How much time would you be able or willing to spend taking this subject:

___ Eleven weeks or less
___ One to three months
___ Four to six months
___ Nine months
___ One year
___ One and one-half years
___ Two years
___ As long as needed

13. What type of subject would you like to take?

___ Basic education such as reading, basic math, writing

___ Biological sciences, such as biology, botany

___ Business skills, such as typing, accounting, bookkeeping

___ Child development, such as parenthood, child care

___ Personal psychology, such as encounter groups, psychology of everyday life

___ Mental health, such as abnormal psychology, crisis intervention

___ Social services skills, such as counseling

___ Mental retardation, such as psychology of exceptional

___ Other, specify_____

APPENDIX C

(EXAMPLE)

Human Services Occupations
Survey of Curriculum Students

Directions: Please complete the following items to the best of your knowledge.

A. Current program: _____

B. Currently employed? Yes ____ No ____

C. Job title, if employed: _____

D. Why are you currently enrolled at Western Piedmont Community College?

_____

E. Would you recommend to a friend that they should enroll in this program? Yes ____ No _____

F. Below are listed several proposed new programs for Western Piedmont Community College. Study the list and indicate your first, second, and third choices. If none of these appeal to you, write "none."

Early Childhood Associate
Mental Health Associate
Paralegal Aide
Social Services Counselor
Teacher Aide
Mental Retardation Associate

1st Choice: _____

2nd Choice: _____

3rd Choice: _____

G. Other comments: _____

_____

APPENDIX D

(EXAMPLE)

Confidential

SURVEY OF HIGH SCHOOL STUDENTS CAREER ASPIRATIONS

TO THE STUDENT: This survey is designed to determine the educational plans and needs of the high school students in this area. Careful consideration of your response will be of benefit in our efforts to help meet your educational needs and those of future graduates. Thank you for your cooperation.

Name:_____

Address:_____

Phone:_____ Sex: Male___ Female _____

A. What are your plans immediately after graduation from high school? (Check one.)

____ 4-year college or university
____ Junior college
____ Community college or technical institute
____ Business college
___ Military service
___ Work, with no further training (Please specify)
_____
___ Other:
_____

B. From the occupational list on page 3, write the choices in which you have a career interest. If your career interest does not appear on the list provided, write in your career choices.

1st Choice:_____
2nd Choice:_____
3rd Choice:_____

C. On page 2 of this survey are the educational programs currently offered and being considered at Western Piedmont Community College. Please list the numbers (T-018, V-033, etc.) of the programs in which you are interested.
1st Choice:_____ 2nd Choice:_____ 3rd Choice:_____

D. Please indicate any programs not listed in which you are interested.

_____

_____

_____

APPENDIX E

FORMULA FOR TEN-YEAR FORECAST OF EMPLOYMENT

Agencies will be asked to report current (1980) employment, employment three years past (1977), and projected employment three years hence (1983).

$$\hat{E}_{90} = \tilde{E}_{85} + \left[5 \cdot \left(\frac{mc_2}{mc_1}\right) \cdot mc_2\right]$$

Where: $\hat{E}_{90}$ = Forecasted Employment 1990

$\tilde{E}_{85}$ = Estimated Employment 1985

$$mc_2 = \frac{(\tilde{E}_{85} - E_{80})}{5}$$ ← estimated annual mean change in employment 1985-1980

$$mc_1 = \frac{(E_{80} - E_{77})}{3}$$ 1980-1977

Adapted from Manpower Information Manual, DCC, June 1973, State Board of Education, Raleigh, p. D-4.

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